

CLAIMS

1           1.    A welding type power source capable of  
2           receiving a range of input voltages and frequencies,  
3           comprising:  
4                an input circuit configured to receive an  
5           input power signal having an input frequency and an  
6           input magnitude and provide a first signal having a  
7           magnitude responsive to the input magnitude;  
8                a preregulator configured to receive the  
9           first signal and provide a dc second signal having a  
10          preregulator magnitude independent of the input  
11          magnitude;  
12               an output circuit configured to receive the  
13          dc second signal and provide a welding type output  
14          power signal having an output frequency independent of  
15          the input frequency and having an output voltage  
16          independent of the input voltage;  
17               a preregulator controller, connected to the  
18          preregulator, and further having a controller power  
19          input; and  
20               a control power circuit configured to receive  
21          the dc second signal and provide a control power signal  
22          to the controller power input, wherein the controller  
23          power signal has a control power magnitude independent  
24          of the input magnitude and a control frequency  
25          independent of the input frequency.

1           2.    The apparatus of claim 1, wherein the input  
2           circuit includes a rectifier.

1           3.    The apparatus of claim 1, wherein the  
2           preregulator magnitude is greater than the first magnitude.

1           4.    The apparatus of claim 3, wherein the  
2   preregulator includes a boost converter.

1           5.    The apparatus of claim 4, wherein the boost  
2   converter includes a slow voltage switched switch and a slow  
3   current switched switch.

1           6.    The apparatus of claim 3, wherein the output  
2   circuit includes an inverter.

1           7.    The apparatus of claim 3 wherein the output  
2   circuit includes a switched snubber.

1           8.    The apparatus of claim 3, wherein the  
2   preregulator magnitude is greater than the control power  
3   magnitude.

1           9.    The apparatus of claim 3 wherein the control  
2   power circuit includes a buck converter.

1           10.   A welding type power source capable of  
2   receiving a range of input voltages and frequencies,  
3   comprising:

4                an input rectifier configured to receive an  
5   input power signal having an input frequency and an  
6   input magnitude and to provide a rectified signal  
7   having a rectified magnitude responsive to the input  
8   magnitude;

9                a slow voltage switched and slow current  
10   switched boost converter configured to receive the  
11   rectified signal and provide a boost dc signal having a  
12   boost magnitude greater than and independent of the  
13   rectified input magnitude;

14               an output circuit, including an inverter with  
15   a switched snubber, connected to receive the dc second

16           signal and to provide a welding type power output  
17           having an output frequency independent of the input  
18           frequency and having an output voltage independent of  
19           the rectified magnitude;  
20                 a controller, connected to the converter and  
21           further having a controller power input; and  
22                 a control power circuit, including a buck  
23           converter connected to receive the boost dc signal and  
24           provide a control power signal to the controller power  
25           input, wherein the controller power signal has a  
26           control power magnitude less than and independent of  
27           the boost magnitude.

1           11. A method of providing welding type power from  
2           a range of input voltages and frequencies, comprising:  
3                 receiving an input power signal having an  
4           input frequency and an input magnitude;  
5                 providing a first signal having a magnitude  
6           responsive to the input magnitude;  
7                 converting the first signal into a dc second  
8           signal having a second magnitude independent of the  
9           input magnitude;  
10                providing an output power signal derived from  
11           the dc second signal, wherein the output power signal  
12           is a welding type output and has an output frequency  
13           independent of the input frequency and further has an  
14           output voltage independent of the input voltage; and  
15                converting the dc second signal into control  
16           power, wherein the control power has a control power  
17           magnitude independent of the input magnitude.

1           12. The method of claim 11, wherein providing a  
2           first signal includes rectifying an ac signal.

1           13. The method of claim 11, wherein the second  
2 magnitude is greater than the first magnitude.

1           14. The method of claim 13, wherein converting  
2 the first signal into a dc second signal includes boost  
3 converting the first signal.

1           15. The method of claim 13, wherein boost  
2 converting the first signal includes a slow voltage  
3 switching and slow current switching a switch.

1           16. The method of claim 13, wherein providing an  
2 output power signal includes inverting the dc second signal.

1           17. The method of claim 13 wherein inverting the  
2 dc second signal includes switching a snubber.

1           18. The method of claim 13, wherein the second  
2 magnitude is greater than the control power magnitude.

1           19. The method of claim 13 wherein converting the  
2 dc second signal into control power includes buck converting  
3 the dc second signal.

1           20. A method of providing welding type power from  
2 a range of input voltages and frequencies, comprising:  
3           rectifying an input power signal having an  
4 input frequency and an input magnitude to provide a  
5 rectified signal having a rectified magnitude  
6 responsive to the input magnitude;  
7           boost converting, including slow voltage  
8 switching and slow current switching, the rectified  
9 signal to provide a boost dc signal having a boost  
10 magnitude greater than and independent of the rectified  
11 input magnitude;

12                   inverting, including switching a snubber, the  
13                   dc second signal to provide a welding type power output  
14                   having an output frequency independent of the input  
15                   frequency and having an output voltage independent of  
16                   the rectified magnitude; and

17                   buck converting the boost dc signal to  
18                   provide a control power signal, wherein the control  
19                   power signal has a control power magnitude less than  
20                   and independent of the boost magnitude, and a control  
21                   frequency independent of the input frequency.

1                   21. A welding type power source capable of  
2                   receiving a range of input voltages and frequencies,  
3                   comprising:

4                   input means for receiving an input power  
5                   signal having an input frequency and an input magnitude  
6                   and for providing a first signal having a magnitude  
7                   responsive to the input magnitude;

8                   converting means for converting the first  
9                   signal into a dc second signal having a magnitude  
10                   independent of the input magnitude, wherein the  
11                   converting means is connected to receive the first  
12                   signal;

13                   means for providing a welding type output  
14                   power signal derived from the dc second signal, wherein  
15                   the output power signal and has an output frequency  
16                   independent of the input frequency and further has an  
17                   output voltage independent of the input voltage, and  
18                   wherein the means for providing an output power signal  
19                   is disposed to receive the dc second signal;

20                   means for converting the dc second signal  
21                   into control power, wherein the control power has a  
22                   control power magnitude independent of the input  
23                   magnitude.

1           22. The apparatus of claim 21, wherein the first  
2 means includes means for rectifying an ac signal.

1           23. The apparatus of claim 22, wherein the  
2 convertor magnitude is greater than the first magnitude.

1           24. The apparatus of claim 23, wherein the  
2 converting means includes means for boost converting the  
3 first signal.

1           25. The apparatus of claim 24, wherein the means  
2 for boost converting includes means for slow voltage  
3 switching and slow current switching a switch.

1           26. The apparatus of claim 25, wherein the means  
2 for providing an output power signal includes means for  
3 inverting the dc second signal.

1           27. The apparatus of claim 26 wherein the means  
2 for inverting includes means for switching a snubber.

1           28. The apparatus of claim 27, wherein the  
2 converter magnitude is greater than the control power  
3 magnitude.

1           29. The apparatus of claim 28 wherein the means  
2 for converting the dc second signal into control power  
3 includes means for buck converting the dc second signal.

1           30. A welding type power source capable of  
2 receiving a range of input voltages and frequencies,  
3 comprising:  
4           a dc bus;  
5           an output circuit configured, having a  
6 control input and to receive the dc bus and provide a

7 welding type output power signal having an output  
8 frequency independent of the input frequency and having  
9 an output voltage independent of the input voltage;  
10 a controller, connected to the control input  
11 and further having a controller power input; and  
12 a control power circuit configured to receive  
13 the dc bus and provide a control power signal to the  
14 controller power input.

1 31. The apparatus of claim 30, wherein the output  
2 circuit includes an inverter.

1 32. The apparatus of claim 31, wherein the output  
2 circuit includes a switched snubber.

1 33. The apparatus of claim 30, wherein the dc bus  
2 has a magnitude is greater than a magnitude of the control  
3 power signal.

1 34. The apparatus of claim 30 wherein the control  
2 power circuit includes a buck converter.

1 35. A method of providing welding type power from  
2 a range of input voltages and frequencies, comprising:  
3 receiving a dc bus having a dc magnitude;  
4 providing an output power signal derived from  
5 the dc bus, wherein the output power signal is a  
6 welding type output; and  
7 converting the dc bus into control power,  
8 wherein the control power has a control power magnitude  
9 independent of the dc magnitude; and  
10 providing the control power to a controller  
11 configured to control the output power.

1           36. A method of starting to provide welding type  
2 power from a range of input voltages and frequencies,  
3 comprising:  
4           receiving an input power signal having an  
5 input frequency and an input magnitude;  
6           providing a first dc signal having a first dc  
7 magnitude responsive to the input magnitude;  
8           deriving a second dc voltage having a second  
9 dc magnitude less than the first dc magnitude  
10          controlling a control converter with the  
11 second dc voltage to produce a control dc voltage;  
12          controlling an output converter with the  
13 control dc voltage to produce an output signal.